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ABSTRACT

Intended for use by all drafting instructors in the Metropolitan Nashville Public Schools, this guide provides a sequential listing of course content and scope. A course description provides a brief overview of the content of the courses offered in the drafting program. General course objectives are then listed. Outlines of the course content are presented for these courses: drafting I, II, and III. Suggested time and specific objectives are provided for each major topic. A listing of textbooks is appended. (YLB)

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VOCATIONAL EDUCATION

DRAFTING

SCOPE AND SEQUENCE

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Metropolitan Public Schools

Nashville Davidson County, Tennessee

Charles O. Frazier, Director

FOREWORD

This scope and sequence guide, developed for the Drafting Vocational Education program, represents an initial step in the development of a systemwide articulated curriculum sequence for all vocational programs within the Metropolitan Nashville Public School System. It is a direct result of needs expressed by teachers, parents, and the business community for sequential structure within the vocational education curriculum. An articulated vocational curriculum allows a student to move from one level of instruction to the next without repeating learning tasks already mastered, and without experiencing gaps in the presentation of relevant instructional material.

A goal of this curriculum effort is to provide teachers a usable guide based on input from the teachers. The initial step was an identification of course content, with all teachers having an opportunity to contribute. What follows is a publication using the teachers' contributions: a sequential listing of objectives and skills for each program offering.

This guide does not include all specific resource materials that may be used to assist students in acquiring minimum competencies. It is to serve as a guide for the sequence of course content and scope of what is to be taught. This guide content is extremely important and its use is encouraged. The suggested competencies and resource materials allow instructors an opportunity to be creative and resourceful in meeting the needs of individual programs and students.

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INTRODUCTION

This guide is to be used by all drafting instructors in the Metropolitan Nashville Public Schools.

This guide is designed to develop continuity and identify minimum competencies for drafting students in the Metropolitan Public Schools. It is hoped that this guide will serve as a skeletal framework for drafting instructors. Any rearranging or variation of unit placement should be confined to the semester in which it is listed, except for safety and Vocational Industrial Clubs of America (VICA) which are applicable to each level and semester.

COURSE DESCRIPTION

The course in drafting is based on five two-hour class periods per week. Through the course content of the drafting program, the student will be given opportunities to learn basic drawing skills and techniques.

In Drafting I, the student will be instructed in basic drafting techniques. These include, but are not limited to isometric projection and working drawing, dimensioning, free hand sketching and machine components and assembly drawings. The student will become proficient in the use of basic tools of the draftsperson.

Drafting II provides opportunities for the student to specialize in the areas of architectural, structural steel, advanced machine drafting, civil and industrial drafting.

Drafting III, if offered, continues in the area of special interest with added instruction in layout by use of transits, levels and other surveying instruments. Students will also have the opportunity to examine the field of cartography.

Students have the opportunity to participate in VICA leadership training and in local, state and national skills competition.

GENERAL COURSE OBJECTIVES

1. To provide experiences in the use of drafting tools and materials
2. To help the students become aware of drafting occupations and activities
3. To foster the habit of making sketches and drawings for conveying ideas to others
4. To help the student develop an appreciation for the role of drafting to industrial planning, processes and organization
5. To create in the student habits of independent and methodical procedures in the making of a drawing
6. To foster an interest in and an appreciation of the importance of mathematics in drafting

COURSE CONTENT FOR DRAFTING I

(First Semester)

I. Orientation (1 week)

Specific objectives:

To discuss school and class policies
To become familiar with the equipment used in drafting
To explore the various careers in drafting
To become familiar with VICA activities

A. Understands school and class rules

B. Learns equipment requirements

C. Explores careers in drafting

D. Understands Vocational Industrial Clubs of America concepts

II. Twentieth century drafting (2 weeks)

Specific objectives:

To identify the three common types of technical drawings
To relate how drafting careers serve the major professions
To identify the traits that are necessary for success in drafting
To identify the styles of lettering and the importance of good lettering in drafting

A. Learns history of the graphic language

B. Explores technical drawing language of the industry

C. Recognizes the importance of technical drawings

D. Recognizes levels of graphic communications

E. Understands the importance of good lettering techniques

F. Demonstrates sketching techniques

III. Instrument practice (2 weeks)

Specific objectives:

Specific objectives continued:

To describe the use, identify the parts and list advantages of drafting instruments
To use drawing instruments as a means of preparing accurate, readable technical drawings
To make drawings, using either the U. S. customary or metric measuring system

A. Uses drafting machine

B. Uses T-square

C. Uses parallel bar

D. Uses electric eraser

E. Uses compass

F. Uses scale

G. Uses triangles

H. Uses pencils

I. Uses French curves

J. Uses protractors

K. Uses erasing shields

L. Uses masking tape

M. Uses lead pointers

N. Uses templates

IV. Geometry for technical drawing (2 weeks)

Specific objectives:

To identify the various basic elements of drafting geometry
To use geometric construction as a tool in developing technical drawings
To enlarge or reduce objects of any size and shape to any given proportion

A. Divides lines and angles into equal parts

B. Constructs triangles

IV. **Geometry for technical drawing continued:**

C. Constructs pentagons, hexagons and octagons

D. Constructs arcs and tangents

E. Demonstrates line usage proficiency

V. **Multiview drawing (4 weeks)**

Specific objectives:

To visualize an object and interpret it graphically through the use of various views
To determine necessary views and draw them in proper relationship
To describe the use of multiview drawings

A. Understands six view principles of an object

B. Determines choice of views

C. Locates necessary views

D. Applies center lines and hidden lines

VI. **Dimensioning (3 weeks)**

Specific objectives:

To interpret dimensioning symbols used on technical drawings
To use the tools and various methods of measurement
To measure and graphically dimension a drawing of an object

A. Draws lines, arrowheads and leaders

B. Applies location and size dimension

C. Dimensions angles, arcs and curves

D. Applies notes

E. Learns metric system applications

VII. **Section (3 weeks)**

Specific objectives:

To identify the basic types of views

Specific objectives continued:

To learn the importance of sectional views
To learn general rules used in sectioning

A. Understands cutting plane in sectional views

B. Understands conventional breaks in sectional views

C. Understands sectional lining and symbols

D. Understands full and half sections

E. Understands offset, revolved and removed sections

F. Understands auxiliary sections

COURSE CONTENT FOR DRAFTING I

(Second Semester)

I. Auxiliary views and revolutions (1 week)

Specific objectives:

To compare the revolution to the auxiliary projection
To explain how to find the true size of an oblique surface
To identify drawing problems that need to be developed with auxiliary projection
To describe the use of the auxiliary projection plane
To illustrate the rules of revolution

A. Understands incline surfaces

B. Learns kinds of auxiliary views and revolutions

C. Understands reference planes

D. Plots curves

II. Pictorial drawings (6 weeks)

Specific objectives:

To recognize the various types of pictorial drawings
To select the most appropriate type of pictorial drawing technique for a given situation
To make a pictorial drawing, using various methods

A. Learns uses of pictorial drawings

B. Develops isometric drawings in section

C. Develops oblique drawings in section

D. Develops one point perspective

E. Develops two point perspective

III. Fasteners (2 weeks)

Specific objectives:

Specific objectives continued:

To identify the common types of fasteners
To describe the basic uses of fasteners
To understand the importance of the different series and classes of fits
To understand the metric translation

A. Learns screw-thread standards

B. Identifies thread forms

C. Differentiates between American standard and unified screw threads

D. Draws schematic and simplified representation

E. Draws threaded fastener types

IV. **Working drawings (4 weeks)**

Specific objectives:

To describe the three types of working drawings and the use of each
To make detail, assembly, and assembly working drawings
To prepare materials and parts lists
To be able to read a working drawing

A. Prepares detail drawings

B. Prepares assembly drawings

C. Understands uses of appropriate scale

D. Determines placement of views

E. Completes materials list

V. **Introduction to specialized drafting areas (3 weeks)**

Specific objectives:

To develop understanding and skill in specialized drafting areas
To apply previously learned skills in depth

A. Develops architectural drafting techniques

B. Develops plane development techniques

C. Develops computer drafting techniques

NOTE: This schedule allows one week each semester for review and examinations.

COURSE CONTENT FOR DRAFTING II

(First Semester)

I. **Fundamentals and orientation (2 weeks)**

Specific objectives:

To review techniques and methods covered in Drafting I
To become acquainted with new products for the draftsperson
To become familiar with classroom and school expectations
To become aware of the many styles of lettering

A. Understands school and classroom rules

B. Reviews layout

C. Reviews lettering

D. Explores vocational opportunities

E. Reviews VICA organization

F. Reviews lines and line quality applications

G. Reviews drafting equipment uses and techniques

II. **Architectural drafting - residential (15 weeks)**

Specific objectives:

To make sketches and drawings as a means to convey ideas to others
To develop a basic set of plans that might be used in the construction of a home
To use the method of perspective and rendering to illustrate a building to be constructed
To become aware of construction procedures used in residential construction

A. Understands components of a designed set of plans

B. Completes preliminary sketching

C. Designs floor plans

D. Designs foundation plans

II. **Architectural drafting - residential continued:**

E. Completes details of construction

F. Draws elevations

G. Draws two point perspective and rendering (optional)

H. Draws a plot plan

NOTE: This schedule allows one week for review and examinations.

COURSE CONTENT FOR DRAFTING II

(Second Semester)

I. **Surveying and plot layout (3 weeks)**

Specific objectives:

To use the transit and layout boundaries
To make contour drawings
To make a plot plan with bearings and distances

A. Uses transit

B. Distinguishes bearings

C. Plans landscaping

D. Learns contour drawing

E. Develops plot plans

II. **Residential area planning (5 weeks)**

Specific objectives:

To learn the functions and necessities of each of the three areas
To develop a plan incorporating all three areas in a design

A. Plans and designs living area

B. Plans and designs sleeping area

C. Plans and designs service area

III. **Custom designed residential plans (6 weeks)**

Specific objectives:

To draw a set of usable house plans
To implement individual design

A. Develops floor plan

B. Develops foundation plan

III. Custom designed residential plans continued:

C. Plans and draws elevations

D. Completes details

E. Draws pictorial

IV. Student options (3 weeks)

Specific objectives:

To make detail and assembly drawings
To draw a set of usable house plans
To use inking and lettering equipment
To measure and graphically dimension a drawing of an object
To draw the measured objects obtained outside the classroom

A. Specializes in:

1. Architectural drafting

2. Advanced machine drafting

3. Computer drafting

B. Completes special assignment

NOTE: This schedule allows one week for review and examinations.

COURSE CONTENT FOR DRAFTING III

(First Semester)

I. **Orientation and review (2 weeks)**

Specific objectives:

To review techniques and methods covered in Drafting I and II
To become acquainted with new products for the draftsperson
To become aware of classroom and school expectations

A. Understands school and classroom rules

B. Understands history of drawing

C. Reviews lettering techniques

D. Explores vocational opportunities

E. Understands VICA concepts

F. Reviews drafting equipment uses and techniques

II. **Working drawings (15 weeks)**

To make detail drawings
To be knowledgeable of assemblies and assembly drawings
To apply dimensions to working drawings
To explore industrial drafting and its uses

A. Explores and develops proficiency in computer drafting

B. Explores and develops proficiency in industrial drafting

C. Prepares comprehensive detail drawings

D. Plans and designs assembly drawings

1. Design assemblies

2. Working-drawing assemblies

3. General assemblies

II. **Working drawings continued:**

E. Plans and designs assembly sections

NOTE: This schedule allows one week for review and examinations.

COURSE CONTENT FOR DRAFTING III

(Second Semester)

I. **Areas of special interest (17 weeks)**

Specific objectives:

To make drawings in areas of special interest to the student
To dimension drawings in areas of special interest to the student
To become acquainted with special tools and equipment for the advanced draftsperson
To be aware of the job possibilities for the advanced drafting student

A. Specializes in architectural drafting

B. Specializes in machine drafting (may include any form of industrial drafting)

C. Specializes in surveying

D. Specializes in pictorial drawing

E. Specializes in cartography

F. Specializes in development and intersections

G. Specializes in cams and gears

H. Specializes in model building

NOTE: This schedule allows one week for review and examinations.

RESOURCE MATERIALS

Textbooks

Brown, James G. Drafting for Industry. New York: Goodhart-Wilcox & Brown, 1973.

French, Svensen, Helsel and Urbanick. Mechanical Drawing, Ninth Edition. New York: McGraw-Hill, 1980.

Giesecke, Mitchell and Spencer. Technical Drafting, Sixth Edition. New York: Macmillan, 1978.

Helper, Donald E., and Paul Wallach. Architecture: Drafting and Design, Fourth Edition. New York: McGraw-Hill, 1982.

Muller, Edward J. Architectural Drawing and Light Construction, Second Edition. Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1976.

Spence, William P. Drafting Technology and Practice. Peoria, Illinois: Charles A. Bennett Co., Inc., 1973.

Spencer, Henry C. Basic Technical Drawing, Revised Edition. New York: Macmillan, 1962.